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UltraNet Edge Storage Router 3000

UltraNet™ Edge Storage Router 3000

Release 3.1.5

Release Notes

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Simplifying Storage Network Management

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Chapter 1
Introduction

This chapter provides a brief description of new features, minimum hardware and software levels, and the compatibility requirements for the release of the UltraNet Edge Storage Router - 3000 Series (“UltraNet Edge 3000”).

What’s New With the Release

Environmental concerns and the desire to protect human health, has led the EU (European Union) to issue the Restriction of Hazardous Substances (RoHS) directive. RoHS eliminates or restricts the use of lead (Pb) and other hazardous substances in electronic products. To comply with RoHS, a new Asynchronous Transfer Mode (ATM) card is available with this release. The new card does not support Packet over SONET (POS) networks, but is otherwise functionally equivalent to the card that it replaces. Table 1-1 summarizes the differences.

Table 1-1 *Differences between Old and New ATM cards*

ATM Cards	RoHS Compliant	Supports POS
Old OC-3 card (CHARM)	No	Yes
New OC-3 card (NEC)	Yes	No

Overview

The UltraNet Edge 3000 interconnects Fibre Channel fabrics over extended distances, using a new or existing IP or ATM network. The UltraNet Edge 3000 can be customized and configured as 1x1 and 2x2 configurations in an IP, or ATM WAN implementation.

Note: 1x2, 2x1, and 3x1 configurations are possible, but not supported as a standard implementation.

The UltraNet Edge 3000 has been designed to be user installable, configurable, and maintainable. The installation can be performed by the customer or with assistance from McDATA Support.

Minimum Software Levels

The following section provides the minimum software levels for the release:

- UltraNet Edge 3000 Software: Version 3.1.5
- UltraNet ConfigManager: Version 5.6.1
- UltraNet WebView: Version 3.4.3

Minimum Hardware Levels

Table 1-1 provides the minimum hardware levels for the release.

***Table 1-2** Minimum Hardware Levels for the Release*

Part Number	Description	Revision
25501164	UltraNet Edge 3000 Chassis	A G - for FICON
20501792	FCBB Card	C D - for FC/9000 compatibility, and for E_port and F_port Disk Streaming functionality (refer to Note)

Table 1-2 *Minimum Hardware Levels for the Release (continued)*

Part Number	Description	Revision
Note: Revision D of the FCBB card (part number 20501792) ships with the v3.1.1.4 or greater release. If you are upgrading from v3.1.1.3, Revision D is required only if you are running the Edge v3.1.1.4 or greater with the FC/9000 or if you are enabling Disk Streaming.		
20501605	FCXL2 Card	C
20501781	Gigabit Ethernet Card	B
470-E00565-100	RoHS compliant Gigabit Ethernet Card	A
20501722	OC-3 ATM/POS Card	B
470-E00556-100	RoHS compliant OC-3 ATM (NEC) Card	A
03142036	Power Supply	H
22301840	Boot Prom	842
22101237	FCBB SFP Multi-mode (Short Wave)	A
22101308	FCBB SFP Single-mode (Long Wave)	A
22101135	Gig-E SFP Multi-mode (Short Wave)	A
22101281	Gig-E SFP Single-mode (Long Wave)	A
22101324	Gig-E SFP Copper	A
22101204	OC-3 ATM/POS Multi-mode (Short Wave)	A
22101278	OC-3 ATM/POS Single-mode (Long Wave)	A

Hardware Requirements for Disk Streaming

Disk Streaming requires revision D of the FCBB card (part number 20501792) and revision 16 of the FPGA, which resides on the FCBB card.

To determine the FPGA revision level for E_Port configurations, use the following commands:

- For E_Port configurations, use the **`fccnt dump backbone`** command.
- For F_Port configurations, use the **`fccnt dump switchport`** command.

The storage devices and associated applications which are supported and non-supported for Disk Streaming are listed in the *UltraNet Edge Storage Router - 3000 Series User Guide* in the "E_Port Disk Streaming Network Recommendations" section.

Compatibility Requirements

The following sections provide hardware and software dependencies.

Compatible Operating System Configurations

The UltraNet Edge 3000 operating system (OS) version is not backward compatible with previous versions. Table 1-3 shows the compatible operating system configurations.

Table 1-3 *Compatible Operating System (OS) Versions*

OS Version	Compatible with OS Version
• Edge OS 3.1.5	• Edge OS 3.1.5
• Edge OS 3.1.4	• Edge OS 3.1.4
• Edge OS 3.1.3	• Edge OS 3.1.3

Note: Peer to peer OS versions must match.

The Edge OS version is supported with the 3.1.1.4 or 3.1.1.3 hardware (see the Minimum Hardware Level section on page 1-2 to determine your hardware level). If one Edge unit in the network requires a hardware upgrade, the software must also be upgraded to OS version. When the OS is upgraded on one end of the network, it must also be upgraded on the remote end.

Fibre Channel Card Dependencies

The UltraNet Edge 3000 supports two types of Fibre Channel cards; FCBB or FCXL2. The FCBB card is standard, the FCXL2 card is only used for FC/SCSI Tape Pipelining (Device Extension) implementations.

Table 1-4 explains the configurations that can be run with each card.

Table 1-4 *Fibre Channel Card Dependencies*

UltraNet Edge 3000 Series FC Card	Supported Configurations	Fibre Channel Switch Requirements
FCBB Card (1 Gigabit or 2 Gigabit)	• FC/SCSI E_port extension	Two Fibre Channel Switches required
	• FC/SCSI F_port Fibre Channel	Fibre Channel Switch cannot be used
	• FICON ISL Extension	Two FICON switches required
	• FICON Extension	No switches required (one may be present)
FCXL2 Card (1 Gigabit)	• N or NL_port (Tape Pipelining)	Fibre Channel Switch optional

FC/SCSI E_port Configurations

An E_port is an expansion port used to link multiple Fibre Channel switches together into a single fabric.

The UltraNet Edge 3000 offers the standard E_port configuration and E_port Disk Streaming which moves data more efficiently in high latency networks than our standard E_port solution. E_port Disk Streaming functions as a subset of our Fibre Channel Device Extension technology. A significant performance gain is normally achieved in networks which limit the number of concurrent SCSI I/O operations and also in networks with high latency.

IP and ATM WANs are supported with E_port configurations.

FC/SCSI E_Port to E_Port

When an UltraNet Edge 3000 is configured for E_port, its peer UltraNet Edge 3000 must also be configured as E_port.

FC/SCSI F_port Configurations

F_port is a port in the fabric where an N_port can attach. F_ports are frame routing ports, which are insensitive to higher level protocols. A port configured for F_port can only connect to another N_port via a point-to-point connection.

The UltraNet Edge 3000 contains an application which acts as a Fibre Channel switch (FCSW) and eliminates the need for an external Fibre Channel switch. When the UltraNet Edge 3000 is configured for use with the FCSW application, it is configured for F_port.

The UltraNet Edge 3000 offers the standard F_port configuration and F_port Disk Streaming which moves data more efficiently in high latency networks than our standard F_port solution. F_port Disk Streaming functions as a subset of our Fibre Channel Device Extension technology. A significant performance gain is normally achieved in networks which limit the number of concurrent SCSI I/O operations and also in networks with high latency.

IP or ATM WANs are supported with F_port configurations.

FC/SCSI F_Port to F_Port

When an UltraNet Edge 3000 is configured for F_port, its peer UltraNet Edge 3000 must also be configured as F_port.

FC/SCSI N_port Configurations

N_port is a node port, or a port on a disk or computer. Ports that are N_port can only communicate with another N_port on another node, or to a switch. NL_port is a *Node Loop Port*; a port supporting the Arbitrated Loop protocol.

When running Tape Pipelining (Device Extension) on the UltraNet Edge 3000, it will be configured for N_port or NL_port. Refer to Chapter 9, Tape Pipelining, in the *UltraNet Edge Storage Router - 3000 Series User Guide* for more information.

FC/SCSI N_Port to N_Port

When an UltraNet Edge 3000 is configured for N_port, its peer UltraNet Edge 3000 must also be configured as N_port.

FICON Port Configurations

An Edge 3000 FICON port can be a connection directly to one of the following:

- a FICON N_port (a MVS FICON Channel Interface or a FICON Control Unit FICON port)
- an E_port from a FICON capable FC Switch
- an F_port from FICON capable FC Switch

Note: FICON support is available over both GigE IP WANs and ATM OC3 WANs.

FICON ISL Extension (E_Port to E_Port)

In this configuration, the Edge FICON interfaces are extending a FICON ISL between two like switches. The McDATA FICON Emulation Features can be enabled on this path if and only if the device IO paths are configured correctly through the Switch Configuration. If there are multiple ISLs between the pair of switches, then vendor specific feature such as Allow/Prohibit and/or Preferred Paths (McDATA Switches) must be defined so that CHPID I/Os flow bi-directionally over the same ISL.

When configuring a FICON path to be a FICON ISL, you must enable the E-port (Cascaded ISL) FICON port option in UCM. A cascaded connection will not correctly initialize without this option enabled.

FICON F_Port to N_Port (or N_port to F_port)

In this configuration, the Edge 3000 FICON port is directly connected to either the Channel Interface or a Control Unit interface on one side and the other side is connected to an F_port on a FICON capable switch.

When configuring a FICON in this configuration, you must not enable the E-port (Cascaded ISL) FICON port option in UCM. A N_port to F_port connection will not correctly initialize with this option enabled.

FICON N_Port to N_Port

In this configuration, the Edge 3000 FICON port on one side is directly connected to a Channel Interface and the remote side is directly connected to a Control Unit interface. This configuration is defined the same as the F_port to N_port configuration described in the prior section.

FC/SCSI E_Port, F_Port, and FICON Compatibility

The UltraNet Edge 3000 supports one Fibre Channel port type configuration in an Edge unit. E_port, F_port, and FICON are ***not*** supported simultaneously.

FC/SCSI Tape Pipelining (Device Extension) Requirements

FC/SCSI Tape Pipelining is also referred to as FC/SCSI Device Extension. The Edge 3000 Series version 3.1.1.4 is the minimum hardware and software (OS) level that supports Tape Pipelining. The Edge OS version and hardware levels 3.1.5, 3.1.4, 3.1.3 and 3.1.1.4 support Tape Pipelining. To determine your hardware level, see the Minimum Hardware Level section on page 1-2.

Chapter 2
Fibre Channel Switch Requirements

This chapter provides configuration information for the internal Fibre Channel Switch (FCSW) application for the UltraNet Edge 3000, the certified models of McDATA, Cisco, and Brocade Fibre Channel switches, and the supported configurations and configuration requirements for the Brocade Multiprotocol Router.

Note: When the UltraNet Edge 3000 is configured for F_port, it uses the internal Fibre Channel Switch (FCSW) application and eliminates the need for an external Fibre Channel switch.

Supported UltraNet Edge Configurations

Table 2-1 provides the supported configurations for the UltraNet Edge 3000 Series.

Table 2-1 *Supported Edge Configurations*

Edge 3000 Series Supported Configuration	Supported Fibre Channel Card
FC/SCSI E_port Extension	FCBB (1 or 2-Gigabit)
F_port	FCBB (1 or 2-Gigabit)
FC/SCSI Tape Pipelining (Device Extension) N or NL_port	FCXL2 (1 Gigabit)
FICON ISL Extension	FCBB (1 or 2-Gigabit)
FICON Extension	FCBB (1 or 2-Gigabit)

FCSW - Internal Fibre Channel Switch Application

The UltraNet Edge 3000 contains an application (FCSW) which acts as a Fibre Channel switch and eliminates the need for an external switch.

Note: FICON connections cannot be defined through an UltraNet Edge 3000 F_Port interface.

See Chapter 2, Hardware Configurations in the *UltraNet Edge Storage Router - 3000 Series User Guide* for more detailed information about the FCSW application.

The F_port (FCSW) functionality in the UltraNet Edge 3000 is enabled by configuring either the default Fibre Channel I/F Type or the individual node type in UltraNet ConfigManager (UCM) to **Fibre Channel Switch (F_port)**. See "Chapter 6, Configuring F_port over an Ethernet WAN" in the *UltraNet Edge Storage Router - 3000 Series User Guide* for configuration details.

When the UltraNet Edge 3000 is configured for F_port, its peer UltraNet Edge 3000 must also be configured as F_port.

Once the node type is configured for **Fibre Channel Switch (F_port)**, the UCM wizard automatically configures the Fibre Channel Switch interface for the internal functionality.

Port Zoning Configuration for F_Port

Port Zoning will require manual configuration if your application requires controller to controller mapping or if you have a mix of applications on multiple Fibre Channel Switch interfaces within the node. Port Zoning should also be selected if you are running Smartbits across the Fibre Channel switches.

To configure the Port Zoning setting, see the section, "Configuring the Fibre Channel Switch Interface" in the *UltraNet Edge Storage Router - 3000 Series User Guide*.

Supported McDATA Sphereon and Intrepid Models

The following McDATA models are supported with the UltraNet Edge 3000 for FC/SCSI E_port, N_port, NL_port, and FICON configurations, as appropriate.

- Sphereon 3216
- Sphereon 3232
- Sphereon 4400
- Sphereon 4500
- Sphereon 4700
- Intrepid 6064
- Intrepid 6140
- Intrepid 10000

Connector Requirements

Table 2-2 lists the required connector type for each model of McDATA switches.

Table 2-2 *Required Connector Types for McDATA Switches*

McDATA Model	McDATA Media	McDATA Connector Type	Edge Connector Type
3216	SFP	LC	LC
3232	SFP	LC	LC
4400	SFP	LC	LC
4500	SFP	LC	LC
4700	SFP	LC	LC
6064	SFP	LC	LC

Table 2-2 *Required Connector Types for McDATA Switches (continued)*

McDATA Model	McDATA Media	McDATA Connector Type	Edge Connector Type
6140	SFP	LC	LC
10000	SFP	LC	LC

Required McDATA Firmware

This section provides the required firmware version for use with the supported McDATA models.The UltraNet Edge 3000 supports 1x1 and 2x2 configurations with all McDATA firmware releases. Table 2-3 shows supported McData models and required firmware.

Table 2-3 *Supported McDATA Models and Required Firmware*

McDATA Model	Required Firmware
3216, 3232, 4400, 4500, 4700*, 6064, 6140	EOS v08.00.00 45
	EOS v08.02.00 07
	EOS v09.00.00 76 (Recommended)
10000*	EOS v06.03.01 01
	EOS v06.05.00 01 (Recommended)

Note: Recommended EFCM code level: 8.7.1or higher

* Cascaded FICON configurations are not supported.

Cascaded Switches and Preferred Path

For cascaded FICON switches, McDATA has an EOS feature that is called Preferred Path. This feature must be enabled so that all ports that are included on a CHPID (or sets of CHPIDs) use the same ISL between the cascaded switches. Customers should inquire with their McDATA support representative to correctly configure the Preferred Path feature.

Required Switch Settings for Edge Configurations

Use the following settings for Edge E_port and FICON ISL configurations:

- Port
  - E-Port
  - 2 Gb
- Switch Parameters
  - Preferred Domain ID: 3 (any unique domain)
  - Rerouting Delay: Disabled
- Switch Fabric Parameters
  - R_A_TOV: 100
  - E_D_TOV: 50
  - Interop Mode: Open Fabric 1.0
- Device connection: any port

  Note: Only WWN Zoning will be allowed.

Supported McDATA FC/9000 and UMD Models

Table 2-4 lists the models certified with the UltraNet Edge 3000 for FC/SCSI E_port, N_port, NL_port, and FICON configurations, and shows the supported firmware versions.

Table 2-4 *Supported Models and Required Firmware*

Model	Supported Firmware
FC9000	5.0.0.0 5.0.4.0 (recommended)
UMD	1.5.0.0 (recommended)

Note: Recommended Enterprise Manager code level: 9.0 or higher

Required Switch Settings

This section provides the required switch settings for the supported FC/9000 models.

FC9000 Switch Settings

Use the following settings for the FC9000 switch:

Switch Fabric Parameters

- R_A_TOV: 10000
- If FC9000 fabric only, E_D_TOV: 6000
- For a multi-vendor switch fabric, E_D_TOV: 5000

UMD Switch Settings

Use the following settings for the UMD switch:

Switch Fabric Parameters

- R_A_TOV: 10000
- E_D_TOV: 5000

Supported Cisco Models

Table 2-5 lists the Cisco switch models certified with the UltraNet Edge 3000 for FC/SCSI E_port, N_port, and NL_port, configurations (no FICON support at this time).

Table 2-5 *Supported Cisco Models and Required Firmware*

Cisco Model	Required Firmware
9216, 9509	2.0.2b
	2.1.2b
	2.1.2e (recommended)

Required Switch Settings

Use the following settings for the Cisco switches:

Switch Fabric Parameters

- E_D_TOV: 5000

Supported Brocade Models

Table 2-6 lists the Brocade switch models that McDATA has certified with the UltraNet Edge 3000 for FC/SCSI E_port, N_port, or NL_port configurations (no FICON support at this time).

***Table 2-6** Supported Brocade Models*

Silkworm 2050	Silkworm 2400	Silkworm 2800
Silkworm 3200	Silkworm 3800	
Silkworm 3250	Silkworm 3850	Silkworm 3900
Silkworm 4100	Silkworm 12000	Silkworm 24000
Silkworm AP7420		

Connector Requirements

Table 2-7 lists the required connector type for each series of Brocade switches.

***Table 2-7** Required Connector Type for Brocade Switches*

Brocade Series	Brocade Media	Brocade Connector Type	USD-X Connector Type
2000	GBICx	SC	LC
All other models	SFP	LC	LC

Requirements for Brocade Switches

The settings for Brocade switches vary depending upon which UltraNet Edge 3000 configuration is implemented (E-port Extension or Device Extension [Tape Pipelining]). Use the Brocade settings shown in the following sections.

Required Brocade Firmware

Table 2-8 provides the required Brocade firmware versions for use with all UltraNet Edge 3000 configurations:

Table 2-8 *Required Brocade Firmware*

Brocade Model		Compatible Applications
Brocade Series 2000		
• v2.6.2	• v2.6.2a (recommended)	for most applications
Brocade 3200 and 3800		
• v3.1.3a	• v3.2.0a • v3.2.1 (recommended)	for most applications
Brocade 3250, 3850, 3900, 12000, and 24000		
• v4.2.0b • v4.4.0b	• v4.4.0g • v4.4.2a • v5.0.1a • v5.0.3a (recommended)	for most applications
Brocade 4100		
	• v5.0.1a • v5.0.3a (recommended)	for most applications

Table 2-8 *Required Brocade Firmware (continued)*

Brocade Model	Compatible Applications
Brocade 7420	
Xpath OS 7.3.0 (recommended)	for most applications

Note: E_port mode must be turned on when using the Xpath OS. Follow the procedure found in the section "Configuring the Port Settings for Brocade Switch AP7420" on page 2-15.

Configuring the Port Settings for Brocade Switches 3200 and 3800

The Speed and ISL R_RDY Mode should be configured using the following procedure. The Brocade port connected to the UltraNet Edge 3000 should be configured to 2G (step 2 below).

1. Enter the **`portcfgshow`** command to display the current port settings:

   ```
   Switch:admin> portcfgshow
   ```

   Example of the **`portcfgshow`** command screen display:

   ```
   Ports               0  1  2  3    4  5  6  7
   ------------------+--+--+--+--+----+--+--+--
   Speed              AN AN AN AN   AN AN AN AN
   Locked L_Port      .. .. .. ..   .. .. .. ..
   Locked G_Port      .. .. .. ..   .. .. .. ..
   Disabled E_Port    .. .. .. ..   .. .. .. ..
   Persistent Disable .. .. .. ..   .. .. .. ..
   ISL R_RDY Mode     .. .. .. ..   .. .. .. ..
                      where AN:AutoNegotiate, ..:OFF, ??:INVALID.
   ```

   The current speed for port 0 (zero) is set for Auto Negotiate, indicated by the **AN**.

2. To configure the port speed, use the following command syntax:

   ```
   Switch:admin> portcfgspeed 0,2
   ```

   Example of the **`portcfgspeed 0, 2`** command screen display:

   ```
   Success: configuration allowed.
   Committing configuration...done.
   ```

```
Switch:admin> portcfgshow
Ports               0  1  2  3    4  5  6  7
------------------+--+--+--+--+----+--+--+--
Speed              2G AN AN AN   AN AN AN AN
Locked L_Port      .. .. .. ..   .. .. .. ..
Locked G_Port      .. .. .. ..   .. .. .. ..
Disabled E_Port    .. .. .. ..   .. .. .. ..
Persistent Disable .. .. .. ..   .. .. .. ..
ISL R_RDY Mode     .. .. .. ..   .. .. .. ..
                where AN:AutoNegotiate, ..:OFF, ??:INVALID.
```

The speed for port 0 (zero) is changed to 2Gig (**2G**).

3. To configure the ISL R_RDY Mode, use the following command syntax:

```
Switch:admin> portCfgISLMode 0,1
```

Example of the **portcfgISLMode 0, 1** command screen display:

```
Committing configuration...done.
ISL R_RDY Mode is enabled for port 0. Please make sure the PID
formats are consistent across the entire fabric.
Switch:admin>

fabric: Reconfiguration due to fabric merge (port 0)
fabric: Reconfiguring (Tue Nov 11 15:06:51 2003)
 5  4  3  2  1

fabric: Subordinate switch
fabric: Domain 2,1
```

Viewing the Switch Settings

To view the settings for the switch, enter the **switchshow** command. The following is an example output.

```
Switch:admin> switchshow
switchshow
switchName:     Switch
switchType:     16.2
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
switchDomain:   2
```

```
switchId:       fffc02
switchWwn:      10:00:00:60:69:c0:0b:1b
switchBeacon:   OFF
Zoning:         ON (Active)
port  0: id 2G Online        E_port 20:00:00:00:88:19:71:ca (upstream)
port  1: id N2 No_Light
port  2: id N2 No_Light
port  3: id N2 No_Light
port  4: id N2 No_Light
port  5: -- N2 No_Module
port  6: -- N2 No_Module
port  7: -- N2 No_Module
Switch:admin>
```

In the preceding output, `2G Online.....E_port 20:00:00:00:88:19:71:ca (upstream)` indicates that a successful E_port has been established. If it was unsuccessful, a world wide name would not appear and it would say `E_port (no license)`.

Configuring the Port Settings for Brocade Switches 3250, 3850, 3900, 4100, 12000, and 24000

The Speed and ISL R_RDY Mode should be configured using the following procedure. The Brocade port connected to the UltraNet Edge 3000 should be configured to 2G (step 2 below).

1. Enter the **`portcfgshow`** command to display the current port settings:

   ```
   Switch:admin> portcfgshow
   ```

   Example of the **`portcfgshow`** command screen display:

   ```
   Ports               0  1  2  3    4  5  6  7
   ------------------+--+--+--+--+----+--+--+--
   Speed              AN AN AN AN   AN AN AN AN
   Locked L_Port      .. .. .. ..   .. .. .. ..
   Locked G_Port      .. .. .. ..   .. .. .. ..
   Disabled E_Port    .. .. .. ..   .. .. .. ..
   Persistent Disable .. .. .. ..   .. .. .. ..
   ISL R_RDY Mode     .. .. .. ..   .. .. .. ..
                      where AN:AutoNegotiate, ..:OFF, ??:INVALID.
   ```

   The current speed for port 0 (zero) is set for Auto Negotiate, indicated by the **AN**.

2. To configure the port speed, use the applicable command syntax:

- For a Brocade 3250, 3850, 3900, or 4100, enter the **`portcfgspeed 0 2`** command:

  `Switch:admin> portcfgspeed 0 2`

  Example of the **`portcfgspeed 0 2`** command screen display:

```
Success: configuration allowed.
Committing configuration...done.

Switch:admin> portcfgshow
Ports                0  1  2  3    4  5  6  7
-------------------+--+--+--+--+----+--+--+--
Speed              2G AN AN AN   AN AN AN AN
Locked L_Port      .. .. .. ..   .. .. .. ..
Locked G_Port      .. .. .. ..   .. .. .. ..
Disabled E_Port    .. .. .. ..   .. .. .. ..
Persistent Disable .. .. .. ..   .. .. .. ..
ISL R_RDY Mode     .. .. .. ..   .. .. .. ..
                where AN:AutoNegotiate, ..:OFF, ??:INVALID.
```

  The speed for port 0 (zero) is changed to 2Gig (**2G**).

- For a Brocade 12000 or 24000, use the following syntax:

  `Usage: portCfgSpeed [SlotNumber/]PortNumber  Speed_Level`

3. To configure the ISL R_RDY Mode, use the applicable command syntax:

- For a Brocade 3250, 3850, 3900, or 4100, enter the **`portCfgISLMode 0 1`** command:

  `Switch:admin> portCfgISLMode 0 1`

  Example of the **`portcfgISLMode 0 1`** command screen display:

```
Committing configuration...done.
ISL R_RDY Mode is enabled for port 0. Please make sure the PID
formats are consistent across the entire fabric.
Switch:admin>

fabric: Reconfiguration due to fabric merge (port 0)
fabric: Reconfiguring (Tue Nov 11 15:06:51 2003)
 5  4  3  2  1
```

```
fabric: Subordinate switch
fabric: Domain 2,1
```

- For a Brocade 12000 or 24000, use the following syntax:

  `Usage: portCfgISLMode [SlotNumber/]PortNumber  Mode`

  Example of the **`portcfgISLMode`** command screen display:

```
Ports                0  1  2  3    4  5  6  7
-------------------+--+--+--+--+----+--+--+--
Speed              2G AN AN AN   AN AN AN AN
Locked L_Port      .. .. .. ..   .. .. .. ..
Locked G_Port      .. .. .. ..   .. .. .. ..
Disabled E_Port    .. .. .. ..   .. .. .. ..
Persistent Disable .. .. .. ..   .. .. .. ..
ISL R_RDY Mode     ON .. .. ..   .. .. .. ..

where AN:AutoNegotiate, ..:OFF, ??:INVALID.
```

  The ISL R_RDY Mode for port 0 is now ON.

4. To configure the locked G_port for device extension, use the following syntax:

   `Usage: portCfGport slot number/port number, mode`

   Example of the **`portCfgGport`** command screen display, where `1` = locked:

```
sw5:admin> portCfgGport 1/3, 1

Done.
```

Viewing the Switch Settings

To view the settings for the switch, enter the **`switchshow`** command. The following is an example output.

```
Switch:admin> switchshow
switchshow
switchName:     Switch
switchType:     16.2
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
```

```
switchDomain:   2
switchId:       fffc02
switchWwn:      10:00:00:60:69:c0:0b:1b
switchBeacon:   OFF
Zoning:         ON (Active)
port  0: id 2G Online         E_port 20:00:00:00:88:19:71:ca (upstream)
port  1: id N2 No_Light
port  2: id N2 No_Light
port  3: id N2 No_Light
port  4: id N2 No_Light
port  5: -- N2 No_Module
port  6: -- N2 No_Module
port  7: -- N2 No_Module
Switch:admin>
```

In the preceding output, `2G Online.....E_port 20:00:00:00:88:19:71:ca (upstream)` indicates that a successful E_port has been established. If it was unsuccessful, a world wide name would not appear and it would say `E_port (no license)`.

Configuring the Port Settings for Brocade Switch AP7420

The Speed and E_Port Mode should be configured using the following procedure.

It is recommended that the Brocade port connected to the UltraNet Edge 3000 be configured to 1 Gb, as shown in the steps below.

1. Enter the **`portcfgspeed`** command to display the current port speed:

   `Switch:admin>portcfgspeed 0`

   Example of the **`portcfgspeed`** command screen display:

   ```
   port 0 speed is: AN
   ```

2. Enter the **`portcfgeport`** command to display the current E_Port mode:

   `Switch:admin>portcfgeport 0`

   Example of the **`portcfgeport`** command screen display:

   ```
   port 0 eport mode is: DISABLED
   ```

3. Enter the **portdisable** command to disable the port before a configuration change can be made:

   Switch:admin>portdisable 0

   Example of the **portdisable** command screen display:

   ```
   port 0 disabled
   ```

4. To configure the port speed, use the following command syntax:

   Switch:admin>portcfgspeed 0 2

   Example of the **portcfgspeed** command screen display:

   ```
   port 0 speed is set to: 2G
   ```

5. To configure the E_Port mode, use the following command syntax:

   Switch:admin>portcfgeport 0 1

   Example of the **portcfgeport** command screen display:

   ```
   port 0 eport mode is: ENABLED
   ```

6. Enter the **portenable** command to enable the port:

   Switch:admin>portenable 0

   Example of the **portenable** command screen display:

   ```
   port 0 enabled
   ```

Viewing the Port Speed Setting

To view the port speed setting, use the following command syntax:

Switch:admin>portcfgspeed 0

Example of the **portcfgspeed** command screen display:

```
port 0 speed is: 2G
```

Viewing the E_Port Mode

To view the E_Port mode, use the following command syntax:

```
Switch:admin>portcfgeport 0
```

Example of the **portcfgeport** command screen display:

```
port 0 eport mode is: ENABLED
```

Configuring a Brocade for Use with a UltraNet Edge 3000

In addition to configuring the Brocade switch settings for use with the UltraNet Edge 3000, you may need to configure the **Flow Control Mode** in UCM if the Remote Switch License is installed.

It is recommended for Brocade Series 3000 switches, the Brocade port connected to the UltraNet Edge 3000 is configured to 2Gbps. This is done by using the **`portCfgSpeed`** command on the Brocade switch. At the Brocade console, type **`portCfgSpeed`** for the syntax.

Switch Settings for the UltraNet Edge 3000 with E-port Extension

The following sections provide the Brocade switch settings when using the Remote Switch License (RSL) with a UltraNet Edge 3000 configured as E-port extension.

Switch Settings with the RSL for use with the UltraNet Edge 3000

Use the following Brocade switch settings when using the Remote Switch License (RSL) with a UltraNet Edge 3000 configured as E-port Extension.

The BBCredits are not a required configuration on the Brocade switch when configuring a UltraNet Edge 3000 for E-port Extension (16 is the default).

- Set the Flow Control Mode setting to 3 in UCM
- Required flash parameters (using the Remote Switch License):
  - fabric.domain: 3 (any unique domain)
  - fabric.ops.E_D_TOV: 5000
  - fabric.ops.R_A_TOV: 10000
  - fabric.ops.dataFieldSize: 2112 (default)
  - fabric.ops.mode.noClassF: 0
  - fabric.ops.**pidFormat: 0 or 1* (see Note)**

Note: *The **pidFormat** may be one or zero depending upon the Brocade switch Series/model and the firmware level used. The PID setting must be consistent throughout the fabric, see the “PID Format Settings” section in this chapter**.**

Switch Settings Without the RSL for Use with the UltraNet Edge 3000

Use the following Brocade switch settings with the UltraNet Edge 3000 when you are **not** using the Remote Switch License (RSL) and the UltraNet Edge 3000 is configured as E-port Extension.

The BBCredits are not a required configuration on the Brocade switch when configuring the UltraNet Edge 3000 for E-port Extension (16 is the default).

- Flow Control Mode should be set to the default (2) in UCM
- Required flash parameters (not using the Remote Switch License):
  - fabric.domain: 3 (any unique domain)
  - fabric.ops.E_D_TOV: 5000
  - fabric.ops.R_A_TOV: 10000
  - fabric.ops.dataFieldSize: 2112 (default)
  - fabric.ops.mode.noClassF: 0
  - fabric.ops.**pidFormat: 0 or 1* (see Note)**

    Note: *The **pidFormat** may be one or zero depending upon the Brocade switch Series/model and the firmware level used. The PID setting must be consistent throughout the fabric, see the “PID Format Settings” section in this chapter.

Configuring the UltraNet Edge 3000 for Brocade Remote Switch License

When using the Brocade Remote Switch License (RSL) with a UltraNet Edge 3000, use UltraNet ConfigManager to configure the UltraNet Edge 3000 Fibre Channel interface to run with RSL.

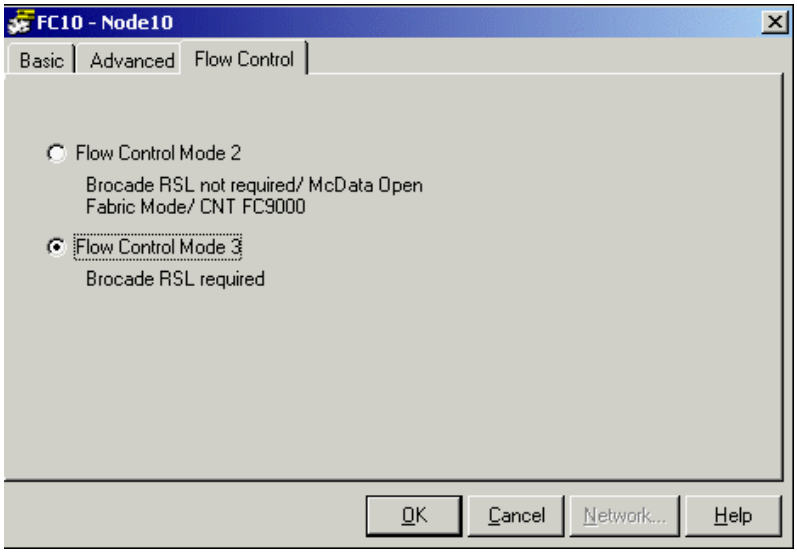
The **No Remote Switch License (Flow Control Mode 2)** option in (UCM) is the default. If you are running without the RSL, you do not need to make any further configuration changes.

If you are using the RSL, use the following procedure to use UCM to configure the UltraNet Edge 3000 Fibre Channel interface for use with the RSL.

Setting the Flow Control Mode in UCM for the RSL

1. From the UCM Network Map, double-click on the Fibre Channel interface.

The **FC10 - Node10** screen appears.



2. Select the **Flow Control** tab.
3. Select **Flow Control Mode 3** (Brocade RSL required) if you are using the RSL.

Note: Flow Control Mode 2 (Brocade RSL not required) is the default.

4. Click **OK**.

PID Format Settings

The required PID format settings for the Brocade Fibre Channel switches are determined by the series/model of the Brocade switch and the firmware level used.

Note: The PID format settings should be consistent throughout the fabric.

Table 2-9 provides the required PID format settings for Brocade 2000 series/models. For all other Brocade series/models, the PID format settings can be either 0 or 1, as long as they are consistent throughout the fabric.

Table 2-9 *Required PID Format Settings Based on Brocade Series/Model*

Brocade Series	With RSL	Without RSL
Brocade 2000 Series Includes: • Silkworm 2050 • Silkworm 2400 • Silkworm 2800 **Note:** Firmware 2.6.2a recommended **Note:** Brocade 2000 series *without* RSL is **not** compatible with Brocade models 3900, 12000, 24000, and 4100. These models only support PID=1, which is **not** supported by Brocade 2000 series *without* RSL.	• **PID = 0 or 1**	• **PID = 0**

Brocade Switch Settings Matrix for all Edge Series

Table 2-10 shows Brocade switch settings for all Edge models.

Table 2-10 *Brocade Switch Settings for all Edge Models*

Brocade Switch Settings	Edge 3000 Series (FCXL2) Tape Pipelining (N or NL_port)	Edge 3000 Series (FCBB) E_port or F_port
• **fabric.domain:**	N/A	3 (any unique domain)
• **fabric.ops.BBCredit:**	7	Not required (16 default)
• **fabric.ops.E_D_TOV:**	2000	5000
• **fabric.ops.R_A_TOV:**	10000	10000
• **fabric.ops.dataFieldSize:**	2048	2112 (default)
• **fabric.ops.mode.noClassF:**	0	0
• **fabric.ops.pidFormat:**	N/A	0 or 1* (See Note)
• **Flow Control Mode** (setting in UCM)	N/A	With RSL = Set to 3 in UCM Without RSL = 2 (default setting in UCM)

Note: The **pidFormat** may be zero or one depending upon the Brocade series/model and firmware level used. The PID setting must be consistent throughout the fabric.

Mapping a Device to a Specific E_port Connection

The **uRouteConfig** command can be used to map connections to a specific E_port connection on the Edge. The following section provides the applicable configuration settings.

The uRoute information is specific to each Brocade switch. Each Brocade switch in the fabric must be configured with the applicable uRoute information.

For example, a configuration contains an Edge Node10 which has E_port connections in Brocade ports 0 and 1 in Brocade domain 1. To map a connection from a Brocade to a specific Edge E_port interface in domain 2, issue the applicable commands from Table 2-11.

Table 2-11 *uRouteConfig Commands*

2000 series/ Models 3200 and 3800	Models 3250, 3850, 3900, 12000, 24000, and 4100
`uRouteConfig 4,2,0` `uRouteConfig 5,2,0`	`uRouteConfig 4 2 0` `uRouteConfig 5 2 0`

where:

- The 1st digit (4 and 5) represents the Brocade port connected to the device(s)
- The 2nd digit (2) represents the remote domain
- The 3rd digit (0) represents the Brocade port that is being mapped to the UltraNet Edge 3000

Note: For more details on the uRouteConfig command and configuration settings, refer to the *Brocade Fabric OS Reference Manual*.

Supported Compatibility with the Brocade Multiprotocol Router

The UltraNet Edge 3000 3.1.4 release provides compatibility with the Brocade Multiprotocol Router. When the Brocade Multiprotocol Router is used in combination with the UltraNet Edge 3000, it allows disk and tape applications to be extended across multiple SANs, regardless of location. This combination allows logically separated SANs to communicate with each other over any distance at a very high performance level. The UltraNet Edge 3000 enables the Multiprotocol Router to communicate across an IP or ATM network. Additionally, it provides disaster recovery capabilities for your data and a more resilient connection.

The Brocade Multiprotocol Router provides connectivity among devices in different fabrics without actually merging the fabrics, allowing data to flow across it while controlling the visibility of devices behind it.

Note: Refer to the Brocade XPath OS Procedures Guide for more detailed information about the Brocade Multiprotocol Router.

Chapter 3
UltraNet ConfigManager

This chapter provides the supported UltraNet Edge 3000 versions for the UltraNet ConfigManager software.

UltraNet ConfigManager (UCM) is a graphical configuration tool that provides a point-and-click process for designing and configuring UltraNet Edge Storage Router nodes. This tool allows the user to self-configure and manage configuration modifications.

This appendix provides the following information about the UCM 5.6.1 software:

- Feature and application support information
- Supported operating systems
- Software compatibility requirements
- Procedures for changing the default software version

New Features

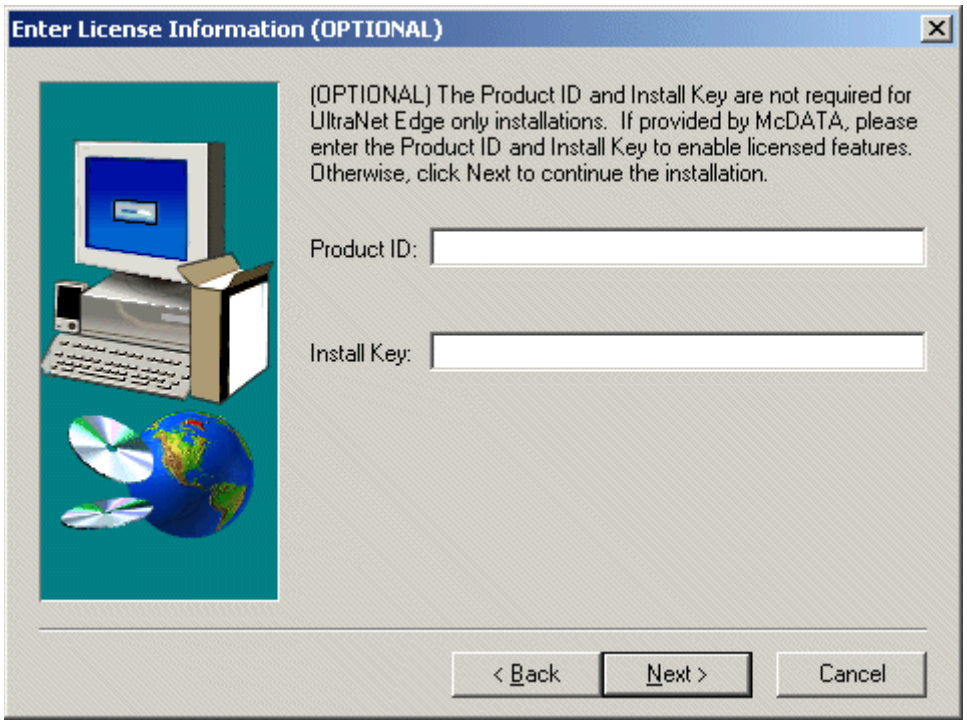
The following new features and applications are supported by UCM 5.6.1:

- Support for Edge 3000 3.1.5 configurations.
- Support for ATM OC-3 (NEC) RoHS compliant interface.

Application Licensing

UCM 5.6.1 includes application licensing for USD and USD-X series nodes. However, an application license is ***not*** required for Edge 3000 series node. Edge 1000 and Edge 3000 series nodes are automatically enabled.

When installing UCM 5.6.1, the following `Enter License Information (OPTIONAL)` screen is displayed.


Enter License Information (OPTIONAL)
(OPTIONAL) The Product ID and Install Key are not required for UltraNet Edge only installations. If provided by McDATA, please enter the Product ID and Install Key to enable licensed features. Otherwise, click Next to continue the installation.
Product ID:
Install Key:
< Back
Next >
Cancel

The `Product I.D.` and `Install Key` are ***not*** required for UltraNet Edge-only installations. If they are provided by McDATA, please enter the `Product I.D.` and `Install Key` to enable all other licensed features. If they are ***not*** provided, click Next to continue the installation.

Application Licensing Highlights

- When you install UCM, you are prompted to enter a product ID and installation key. If you do ***not*** enter a product ID and installation key, UCM is installed but only Edge nodes are enabled.
- Product ID and Installation Key are obtained from Technical Support.
- Provides support for an expiration date. If you do ***not*** enter a product ID and installation key, there is no expiration date.
- The application license contains an expiration date which can be viewed by selecting the **About** function from the Help Menu.
- UltraNet ConfigManager informs you when you have 90 days or less to renew your license.
- Once the application license expires, the UCM application terminates.

Supported Operating Systems

The UltraNet ConfigManager software is supported on the following operating systems:

- Microsoft Windows 2000 (Service Pack 1 and higher)
- Microsoft Windows XP

Software Compatibility Requirements

UltraNet ConfigManager 5.6.1 supports the following release versions of UltraNet Edge 3000 software:

- Edge 3000 3.1.5
- Edge 3000 3.1.4
- Edge 3000 3.1.3
- Edge 3000 3.1.2
- Edge 3000 3.1.1.4
- Edge 3000 3.1.1.3
- Edge 3000 3.1.1

Procedures for Changing the Default Software Version

The default Edge 3000 software version can be changed for the entire network or for the existing nodes on the Network Map.

Changing the Default Version for the Entire Network

Use the following procedure to change the default Edge 3000 software version for the entire network.

Note: This change takes effect for the next node that is added to the Network Map. To change the Edge 3000 software version for existing nodes on the Network Map, refer to the "Changing the Version for Existing Nodes on the Network Map" procedure in this chapter.

1. Select the Options from the Tools Menu.

2. Once the Options dialog appears, click the UltraNode tab.

3. From the UltraNode tab, select the appropriate software version from the Default Version drop-down list in the Edge Node section of the dialog. All selectable software versions are displayed.

4. Click OK or Apply to accept the change.

Changing the Version for Existing Nodes on the Network Map

To change the Edge 3000 software for existing nodes on the Network Map, select the Node Version Wizard function from the Tools Menu. The Node Version Wizard allows you to change the version for one or more nodes.

Chapter 4
UltraNet WebView

UltraNet WebView

This chapter provides the supported platforms, internet browsers, and minimum system requirements for the UltraNet WebView software. UltraNet WebView is an optional software tool that is browser-based and allows the user to monitor the network and the UltraNet Edge Storage Router 3000 remotely from any global location.

WebView 3.4.3 Feature/Application Support Information

Supported Operating Systems and Internet Browsers

Following are the supported operating system and internet browser combinations:

- Microsoft Windows 2000 (with Service Pack 3): Microsoft Internet Explorer 5.0, 5.5, and 6.0
- Microsoft Windows XP Pro (with Service Pack 1): Microsoft Internet Explorer 6.0
- All tests were performed using Java 1.4.2_06 on the hosts.

Minimum System Requirements

Following are the minimum system requirements for UltraNet Webview:

- Microsoft Windows 2000 or XP operating system
- 266 Mhz CPU (500 Mhz CPU recommended)
- 64 MB RAM (256 MB RAM recommended)
- ~200 MB of free hard disk space

Java Plug-In

The supported browser, Internet Explorer requires a plug-in for the Java applets to function properly in WebView. The required plug-in is Java(TM) 2 Runtime Environment, Standard Edition, version 1.4.2_06.

Note: If you do not have external web access, download the plug-in (j2re-1_4_2_06-windows-i586-p.exe) from the WebView CD-ROM.Internet Explorer requires that you download an executable file and install the plug-in. Refer to the WebView Online Help or the WebView README located on the WebView CD for a brief description of the procedure to clarify the process.

Compatibility Requirements

Table 4-1 shows the compatible versions of WebView for each released version of the UltraNet Edge 3000.

Table 4-1 *Compatible WebView and Edge Software Versions*

UltraNet WebView	Compatible with UltraNet Edge 3000
Version 3.4.3	• Version 3.1.5
Version 3.4.2	• Version 3.1.4 • Version 3.1.3 • Version 3.1.2
Version 3.3.1	• Version 3.1.2
Version 3.2	• Version 3.1.2 • Version 3.1.1.4 • Version 3.1.1.3
Version 3.1	• Version 3.1.1.1.2 • Version 3.1.1.1 • Version 1.5.1.2

Appendix A
Resolved Defects and Known Issues

This appendix provides the resolved Product Defects and Service Requests and a list of Known Issues at the time of the UltraNet Edge 3000 3.1.5 release.

Resolved Service Requests and Product Defects

Table A-1 provides a brief description of the problem and the customer impact prior to the fix.

Table A-1 *Resolved SRs and PDs in the Edge 3.1.5 Release*

Affected Customer Application	Affected Feature	Description	Customer Impact	Product Defect Number	Reported Frequency
FICON Channel Extension	FICON Support	Several issues concerning enhanced FICON Performance and Failover are addressed in this release.	Significant improvements in FICON performance and robustness.	1-S0LN2	Internal
FICON Channel Extension	FICON Support	In ISL topologies, BB credits may be forced to 16 without regard for the E_port BB credit setting.	May result in performance problems in cascaded FICON environments.	1-S2232	Internal
Gigabit Ethernet	Ethernet Support	PCI bandwidth exceeded errors interrupts under high load, non-compressible bidirectional data traffic cause Gnic3 resets.	May negatively impact network peformance	1-RQD3N	1

.

Appendix B
Feature and Compatibility Matrix

Edge Features, UCM, and Webview Compatibility

Table B-1 lists the Edge 3000 releases and shows the compatible versions of UltraNet ConfigManager and WebView, related features, and release notes versions.

Table B-1 *Edge 3000 Releases by Application and Feature*

Release Version	Tape Pipelining	UCM Version	WebView Version	Features Released	Release Notes
3.1.2	X	5.2.1	3.3	• FICON Emulation with GigE Only - XRC & VTS & Tape • FICON Shuttle Mode with GigE Only - CTC and other non-storage devices • Management Changes - MIB Changes (inVSN Enterprise EE) • UCM for Compression and Load Balancing Licensing (GigE & OC-3) • F-port Disk Streaming • Mixed Application Mode with GigE only - E-Port and Tape Pipelining in the same Edge box • Bug fixes	958-000502-000
3.1.3	X	5.4.1	3.4.2	• FICON Emulation with OC-3- XRC & VTS & Tape • FICON Shuttle Mode with OC-3 - CTC and other non-storage devices • Bug fixes	958-000502-313
3.1.4	X	5.5.1	3.4.2	• RoHS compliant Ethernet interface	958-000502-314
3.1.5	X	5.6.1	3.4.3	• RoHS compliant ATM interface	958-000502-315

Appendix C
Switch Considerations for FICON

This appendix describes fibre channel switch considerations for Edge 3000 FICON extension.

FICON Director (Switch) Considerations

There are 3 key things to consider when working in FICON configurations with switches.

- Whether or not an ISL is involved, and if so, ensuring that ISL paths are properly configured.
- What the Fibre Channel bb-credits value should be.
- What the Fibre Channel ports speeds should be set to.

FICON supported Switch Configurations

MCDATA Ultranet systems support the following configurations:

- ***Point-to-Point (direct attachment; no switches).*** The "Point-to-Point" topology refers to configurations where the UltraNet Edge fibre channel interfaces are directly connected to host and device interfaces (i.e. N_Port extension).
- ***Switched point-to-point (single switch).*** The "Switched Point-to-Point" topology encompasses configurations that include a single switch (i.e. F_Port extension) on only one side of the WAN.
- ***Cascaded Director (Switch) ISL (two switches).*** The Cascaded Directors topology includes two switches, and only two switches, with one switch on both sides of the WAN. In this case the UltraNet systems are used to extend the ISL (i.e. E_Port extension) between the two switches. The Cascaded Director topology is used to extend MVS host to device cascaded configurations as well as device to device configurations such as IBM VTS and Sun VTSS peer to peer configurations .

The Cascade Switching topology, which involves 3 or more switches, is not supported.

Customer Impact

Fibre Channel links may fail to properly initialize if these guidelines are not followed. In addition, having the bb_credits too low will result in device paths not coming online or Fibre Channel aborts (MVS interface control checks). FICON emulation will fail if all the frames associated with a device do not cross the same ISL.

Configuring for FICON Cascaded Director (ISL) Topologies

If the MCDATA Ultranet systems are placed between switches in an ISL configuration, the FibreChannel file should contain the following statement :

```
SwitchWwnProxy=yes
```

When configuring with UCM, you will also have the opportunity to indicate an ISL configuration.

ISL failover is not supported when configured for FICON Emulation. If you are running in FICON Shuttle mode, ISL failover can be used.

Configuring for FICON Point-to-Point or Switched Point-to-Point Topologies

If the MCDATA Ultranet systems are attached directly or in a single switch environment, the FibreChannel file must have SwitchWwnProxy set to no. See the FibreChannel file documentation section for more information. In other words, the FibreChannel file should contain the following statement :

```
SwitchWwnProxy=no
```

When configuring with UCM, you will also have the opportunity to indicate a direct or single switch configuration. Under FICON Port Options select the "F-Port or N-Port" button. See the sample UCM window below.

Ensuring Sufficient bb_credits are Configured

The addition of McDATA extension equipment to a FICON configuration will generally require that a minimum of 60 bb_credits be available to all Fibre Channel ports between and including the end points. In general, the MVS host and devices will have in excess of 60 bb_credits. Many switches may have default bb_credits of 16. 16 bb_credits will not be sufficient extending a FICON channel over distance. Having the bb_credits too low will result in device paths not coming online and Fibre Channel aborts (MVS interface control checks).

Setting the Fibre Channel Port Speed

All Fibre Channel switches allow a port to be set to auto negotiation , 1 Gbps or 2 Gbps. Ultranet Fibre Channel link startup is more efficient and more reliable when the Fibre Channel ports are set to a specific speed, when available. Most devices and IBM host channels are not configurable.

McDATA recommends that the attached Fibre Channel switch port be configured to 2 Gbps when attached to a Edge 3000. If necessary, the Edge 3000 can also be set to a specific speed using the `PortSpeed` parameter in the FibreChannel configuration file.

Setting the Fibre Channel Port Type

Ultranet Fibre Channel link startup is more efficient and more reliable when the Fibre Channel ports are set to a specific type, rather then the generic type (G_Port). When configured as a G_Port, a switch will first attempt to send an ELP frame to determine if E_Port will be successful. If the ELP is not successful then the port will wait for a FLOGI frame to arrive. This can cause difficulty during link startup for extended non ISL topologies, or switch F_Ports. Certain devices will have more difficulty then others when operating as G_Ports in extended environments.

High Integrity Feature

When MCDATA Ultranet systems are located between FICON cascaded directors (switches) in an ISL configuration (E-Port/B-Port), IBM requires that the "High Integrity" feature be installed (Secure Fabric be enabled). The High Integrity feature is enabled in the switch configuration. If enabled, the MCDATA Ultranet FibreChannel file must specify `SwitchWwnProxy=yes`.

McDATA i10k, 6140, 6064, and 3232 Switches

It is very important to ensure that the McDATA switch port is configured for extended distance by increasing the bb_credits beyond the default of 16. The bb_credits should be increased to 60 or above. Failing to do so will not only affect performance but could result in a bottle neck causing FICON aborts (timeouts). In older McDATA switches you may have to ensure that the McDATA switch port is configured for extended distance by selecting the 10-100 km column in the configure ports window. Doing so will change the number of bb_credits to 60.

McDATA switches may be installed with a McDATA Feature called preferred path ISL configuration. If the preferred path is mis-configured, the Edge 3000 may only see traffic in one direction, causing FICON emulation processes to fail. Be sure traffic for a CHPID is flowing in both directions (Rfx and Tfx entries) on the same ISL.

A McDATA switch port defined as FICON (S/390 mode) automatically behaves as a G-Port (generic port). You are not able to set the port type as you can for open systems. G-Ports first attempt to bring up a link as an ISL (E-Port). If attached to a non-ISL device, the port automatically switches to an F-Port.

In general the Firmware Revision should be 08.00.00 or above.

Note: These McDATA switches generally use a setting of 60 for bb_credits on all FICON extended ports.

McDATA UMD Switch (Firmware Revision 1.5 or above)

The McDATA UMD has a feature called "flow groups" that must be enabled in cascaded configurations in order for Ultranet FICON emulation support to operate correctly. In the case of XRC operations in UMD cascaded configurations that have multiple extended ISLs, channel detected errors will occur when the "flow groups" feature is not enabled or defined correctly. In the case of FICON tape pipelining configurations in UMD cascaded configurations with multiple extended ISLs, pipelining will not be entered if this feature is not enabled or if it is incorrectly configured.

To configure flow groups, the ISL and associated devices (ports) should be added to separately defined flow groups. Your ISLs should be set as exclusive. You should then remove any alternate paths and disable failover and failback in your ISL Path Groups.

Note: The UMD has a default setting of 100 bb_credits on all FICON extended ports.

Cisco MDS 9000 Switch

The Cisco switch "VSAN" feature must be utilized in ISL configurations in order for Ultranet FICON emulation support to operate correctly. The VSAN must be configured such that all elements (devices) within the VSAN exchange data over a single ISL

McDATA recommends Cisco MDS Firmware Revision: 2.1.2e or above. 2.0.2b maybe used with a minimum Edge level of 3.1.3.2.2 or 3.1.5 and above. The Cisco 2.0.2b version has known problems with recovery from power failures.

Note: The MDS 9000, by default, will be allowed the maximum of 120 bb_credits on all FICON extended ports. That is the limit for the Ultranet Edge platforms.

FICON Emulation Requirements for Switches

For MCDATA Emulation processing to function correctly, the responses to Host I/O (channel I/O) must be received on the same on the same ISL as the commands. This is contrary to a normal cascaded FICON switch configuration in that the switches treat the ISLs as just a path to the peer switch with no consideration for the CHPIDs that are using the paths. Switches will normally route inbound ports to a remote switch over the least used operational ISL to that remote switch. In those configurations, the ISL used for commands or data frames from a Channel to a CU on a CHPID may not be the same ISL used by the switch to route responses back to the Channel FICON interface.

There are features in all the McDATA switch products that can be used to define rules for ISL usage. The switch specific rules are used to select the ISL that is used for a combination of inbound ports referencing a remote switch domain. Rules can be defined within the Switch Configuration to at least encourage the switch to route the traffic over a specific ISL.

McDATA i10k, 6140, 6064, 4700, and 3232 Switches - Preferred Path Feature

The McDATA switches have a feature that is called Preferred Path. The name is accurate in that the switch will use that ISL if it is operational when frames are received from that port that are destined for the remote domain. If that ISL is not operational, the switch will route via any available ISL to that domain. When that happens, the FICON emulation processing will fail. To avoid that situation, the allow\prohibit feature must also be used.

McDATA i10k, 6140, 6064, 4700, and 3232 Switches - Allow\Prohibit Feature

The allow/prohibit feature allows a McDATA user to configure the ISL ports that are allowed to be routed to for all inbound ports. In order to avoid configurations that would not function in a McDATA FICON emulation configuration, all other ISL ports should be prohibited for use for traffic from that port. This feature, if configured, would remove automatic ISL failover, but would also always ensure that McDATA emulation processing could function if the ISL was available.

In both switches, the combination of inbound port and destination domain (switch) are used to define the ISL that should be used for the flow between the cascaded switches.

McDATA's emulation processing creates FICON commands and responses on extended FICON CHPIDs, and must know exactly what exchanges are occurring between a Channel and a CU on a CHPID to function correctly. Therefore, the same ISL is used for commands to a CU and for the responses to those commands to the Channel.